

INDUCTOR CURRENT SENSING SCHEME FOR PWM REGULATOR

ABSTRACT

An inductor current measurement scheme generates an output voltage as a function of inductor current in a pulse width modulation-based DC-DC voltage converter. The converter has an upper controlled switch and a lower controlled switch coupled in series between an input voltage terminal and a reference voltage terminal. A common connection of the upper controlled switch and the lower controlled switch provides a phase node voltage. An inductor L and a parasitic direct current resistance (DCR) are coupled between the phase node and an output node coupled to a load. The scheme generates a sense current as a function of the difference between the phase node voltage and the output voltage. This sense current is then supplied to a resistor-capacitor network comprised of a resistor R_s and a capacitor C_s , wherein the product of $R_s \cdot C_s = L/\text{DCR}$, so as to produce a voltage across the resistor-capacitor network that is proportional to the inductor current.